I. Project Title: **Humpback chub population estimate in Desolation/Gray Canyon, Green River, Utah.**

II. Principal Investigators:

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III. Project Summary:

The RIP recently identified recovery goals for the endangered humpback chub. Recovery goals are based in part on maintaining populations of humpback chub in several locations, among which is the Desolation/Gray canyon population on the Green River. Identifying, maintaining, and monitoring a population necessitates obtaining accurate population estimates.

Objectives:

1. To obtain a population estimate of late juvenile/adult humpback chub in Desolation/Gray Canyon.

2. To determine if a relationship exists between ISMP catch rates and population size.

Three sampling passes were conducted through Desolation/Gray canyons on August 31 – September 8, September 28 – October 4, and October 22–29 to make up the third year of the current three year population estimate. Humpback chub sampling in the past has occurred in the summer and targeted times when flows were below 8,000 cubic feet per second (cfs) to maximize catch rates. This year sampling was conducted in the fall to

avoid the capture of spawning Colorado pikeminnow and to reduce handling stress on humpback chub. Flows during sampling in 2003 ranged from 1050–1470 cfs. A total of 12 sites were sampled throughout the canyons including the four long-term trend sites at RM 185, 174.4, 160.4, and 145.7.

A total of 223 individual humpback chub were collected in Desolation/Gray canyons by trammel netting, electrofishing, hoop netting and minnow trapping. Trammel nets yielded the highest catch of humpback chub. Trammel net catch rates were low during the first two passes and increased by the third pass, electrofishing resulted in only one humpback chub, and hoop net and minnow trap catch rates were low and similar. Average total length of chubs caught was 255 mm with a range of 114- 434 mm. Long term recaptures (from previous years) were observed during all three trips.

IV. Study Schedule:
a. Initial year: 2001
b. Final year: 2003

V. Relationship to 2003 RIPRAP:
Green River Action Plan: Mainstem (pg. 27)
V.B. Conduct population estimate for humpback chub.
V.B.1. Desolation/Gray

VI. Accomplishments of FY03 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

Three sampling passes were conducted through Desolation/Gray canyons on August 31 – September 8, September 28 – October 4, October 22–29. A total of 12 sites were sampled throughout the canyons including the four long-term trend sites at RM 185, 174.4, 160.4, and 145.7. The other sites were located at RM 202, 182, 174.2, 166.8, 158.7, 155, 153.5, and 147.5. Four "wild card" sites from previous ISMP monitoring efforts were included within the twelve sites. In general, sampling occurred during fall base flows. Sampling was scheduled for this time when ambient and water temperatures were lower to reduce stress on humpback chub collected, and at a time when Colorado pikeminnow would not be spawning. Average water temperatures during each pass were, 23.0, 19.0 and 11.5 ºC, respectively. Flows were 1050–1250 cfs during the first pass, 1300–1520 cfs during the second pass, and 1430–1470 cfs (all flows determined by USGS gage #09315000, Green River at Green River gage). No Achilles (inflatable sport boat) were used in the canyon this year because of low flows. A 14' raft with a 9.9 motor and a 16' cataraft with a 30 HP motor were used to work trammel nets. An oar driven 14' raft was used to conduct electrofishing. Some sites had reduced areas for sampling because of low flows.

Past research indicates that trammel nets provide the greatest numbers of adult sized chubs and electrofishing is a better technique to collect juveniles. Trammel nets were utilized to target the adult component of the Desolation/Gray humpback chub population.

Six to eight 75' trammel nets were set at each sampling location, depending on availability of habitat at each site. Trammel nets were fished at each site from late afternoon until midnight and again the next day during the pre-dawn and morning hours. Each net was checked at one and a half to two hour intervals  One night was spent at each of the twelve sites. Electrofishing was conducted in attempt to maximize our captures of the juvenile component of the population and provide a more accurate description of the Desolation/Gray humpback chub population size distribution. One pass of electrofishing was conducted at each of the twelve study sites in 2003. In 2002, electrofishing had been conducted between sites as well. However, very few fish were collected in these locations (2% of total humpbacks caught from all methods). In addition to electrofishing and trammel netting, hoop nets and minnow traps were set at each site. Three hoop nets and three minnow traps were set per site. Hoop nets and minnow traps were baited with cat food and set parallel to flow if any existed. Both the nets and traps were set in the afternoon after arrival at each site and checked in the morning prior to leaving.

A total of 258 humpback chub were collected in 2970.2 trammel net hours during the three passes through Desolation/Gray canyons, yielding an overall catch rate of 0.088 fish/net hour (Table 1). Catch rates of chub increased across sampling passes. Fifteen percent of chub collected were recaptured at least once within the same pass at the same site, increasing the stress on those individuals. Eleven hours were spent electrofishing and resulted in the capture of one humpback chub. Hoop nets and minnow traps set at each of the sampling sites during the first two passes collected six chubs, two of which were juveniles.

Overall, average total length of all humpback chub collected by all methods was 256 mm (Figure 1). Five of the humpback chub collected were subadults (< 200 mm TL), four of these were taggable (> 150 mm TL). Average total length of humpback chub caught in trammel nets was 256.2  mm with a range of 188–434 mm. Humpback chub captured in hoop nets averaged a total length of 231 mm (n=5, range 196–266 mm). One chub (not identified to species because of size) was collected in a minnow trap, and its total length was 114 mm.

One humpback chub was recaptured on the third pass that had been captured on the first pass. It had moved fourteen miles downstream. No other movement of chub was observed. Fifteen total long term recaptures (fish PIT tagged in previous years) were captured in 2003.

The results presented in this report are a preliminary summary of the raw data. A population estimate will be generated following further verification and analysis of this data.

Table 1. Summary of chub catch by each method employed in Desolation/Gray canyon during 2002. Note: This table is a total of *Gila* spp. (since fish at the time of capture were all identified as chub, and later positively identified) collected including fish that escaped during measurements or fish that were recaptured at the same site. Numbers elsewhere in this document may differ since those that escaped or were captured more than once may not be included in other analyses (i.e., length frequency histograms).

| Method | Pass | Number of chub | Effort (hours) | Mean CPUE (fish/hour) |
|---|---|---|---|---|
| Trammel Net | 1 | 44 | 971.17 | 0.044 |
| | 2 | 52 | 961.86 | 0.054 |
| | 3 | 162 | 1037.17 | 0.165 |
| | 1-3 | 258 | 2970.2 | 0.088 |
| Electrofishing | 1 | 0 | 7.62 | 0 |
| | 2 | 1 | 3.28 | 0.166 |
| | 1&2 | 1 | 11 | 0.139 |
| Hoop Net / Minnow Trap | 1 | 4 | 1156 | 0.003 |
| | 2 | 2 | 1016 | 0.001 |
| | 1&2 | 6 | 2173 | 0.002 |

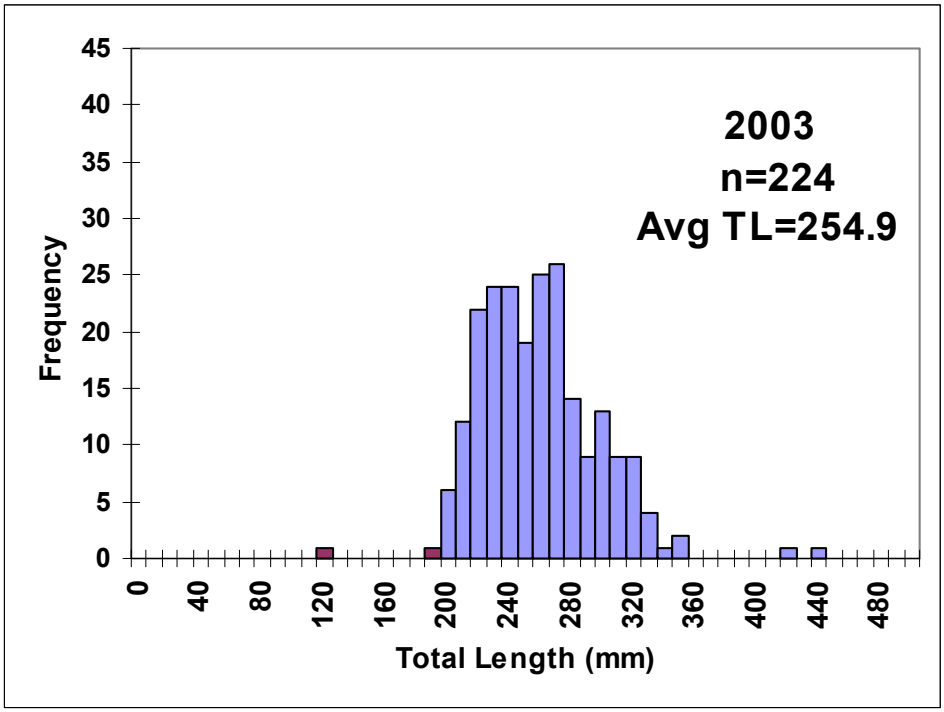


Figure 1. Length frequency distributions for all *Gila* spp. collected in Desolation/Gray Canyons on the Green River during 2003.

VII. Recommendations:

- If fall sampling for this population estimate is to continue, a window of higher catch rates of humpback chub may exist in the fall after the middle of October or when water temperatures are around 10 ºC. Therefore, sampling should be conducted around this time to additionally reduce stress on fish collected.

- Late spring/early summer sampling for this population estimate should be revisited. Lower catch rates during Fall 2003 relative to late spring/early summer sampling in the previous two years is consistent with historic data from Desolation/Gray canyons. A more accurate population estimate is possible from late spring/early summer sampling.

- A holding pen for chub should be utilized at each site to prevent repeated captures of the same individuals and lessen handling stress.

VIII. Project Status: Ongoing
Third year of three for project completed.

IX. FY03 Budget:

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|---|---|
| A. Funds budgeted: | $104,000 |
| B. Funds expended/obligated: | $ 83,200 |
| C. Difference: | $ 20,800 |
| D. Percent FY2003 work completed: 80% | |
| E. Recovery Program funds spent for publication charges: | $ 0 |

X. Status of data submission:
Data will be entered on the computer and transferred to USFWS by January 15, 2004.

XI. Signed: J. Michael Hudson Date: 11/25/2003